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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/755,626	01/12/2004	Mingchun Dong	03-184	9389

7590 03/07/2006

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EXAMINER

GORMAN, DARREN W

ART UNIT	PAPER NUMBER
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3752

DATE MAILED: 03/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	10/755,626		DONG ET AL.	
	Examiner		Art Unit	
	Darren W. Gorman		3752	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 9-12 and 16-19 is/are allowed.
- 6) ☒ Claim(s) 1-5, 13 and 15 is/are rejected.
- 7) ☒ Claim(s) 6-8 and 14 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: ____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>01/12/2004</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Information Disclosure Statement

1. The IDS filed on January 12, 2004 is hereby acknowledged and has been placed of record. Please find attached a signed and initialed copy of the PTO 1449. It should be noted that US Patent No. 5,685,490 to Ausman et al. was cited twice on Applicant's PTO 1449. The examiner has lined through the duplicate citation of the aforementioned reference in order to prevent said citation from being listed twice on a patent granted from the instant application.

Minor Claim Suggestions By Examiner

2. The following change(s) are recommended to improve clarity of the claims. The claims have been examined on the merits including the suggested changes below.

- In claim 4, on line 2, -- wherein said fuel injector further comprises -- should be inserted after "and"
- In claim 9, on line 10, "a nozzle valve member" should be replaced with --said nozzle valve member--
- In claim 14, on line 3, -- chamber -- should be inserted between "pressurization" and ";

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Art Unit: 3752

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-5, 13 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Kanesaka, USPN 4,598,863.

Regarding apparatus claims 1-5, Kanesaka shows an embodiment of a fuel injector (see Figures 14 and 16) comprising an injector body (101) having disposed therein a needle control chamber (chamber having spring 110) and a high pressure space that includes a fuel pressurization chamber (chamber partially defined by lower wall of member 104 where the injection end control valve 105 reciprocates); a nozzle valve member (120) with a first closing hydraulic surface (upper end wall of 111) exposed to fluid pressure in the needle control chamber; an auxiliary valve member (105) positioned in the injector body and being movable between an open position (as shown in Figure 14) in which the high pressure space is fluidly connected to the needle control chamber, and a closed position (as shown in Figure 16) in which the high pressure space is blocked to the needle control chamber, the auxiliary valve member including a second closing hydraulic surface (lower end wall of 105) exposed to fluid pressure in the fuel pressurization chamber of the high pressure space; and a biasing spring (108) operably coupled to bias the auxiliary valve member toward the open position. Kanesaka further shows a nozzle supply passage (118) fluidly connected to the fuel pressurization chamber, the second closing hydraulic surface being exposed to fluid pressure in the nozzle supply passage. And further, Kanesaka shows a second biasing spring (110) operably positioned in the needle control chamber to bias the nozzle valve member toward a closed position. As to claim 5, Kanesaka also discloses that fuel leaked from a gap between member (104) and sliding portion (106) of the auxiliary valve member is returned through a hole (136) to a fuel tank at low pressure (see

Art Unit: 3752

column 11, lines 65-68). Since that gap is in fluid communication with the needle control chamber via passage (116), then passage (116) reasonably reads on a vent passage fluidly connecting the needle control chamber to a low-pressure space.

Regarding the method steps recited in claims 13 and 15, in use, the structure shown by Kanesaka, as discussed above with regard to the apparatus of claims 1-5, is capable of performing the method steps recited.

Allowable Subject Matter

5. Claims 9-12 and 16-19 are allowed.

6. The following is a statement of reasons for the indication of allowable subject matter:

The prior art, alone or in combination, did not show or teach a method of increasing nozzle valve opening pressure in a fuel injector including the step of increasing the nozzle valve opening pressure above the base valve opening pressure at least in part by biasing the auxiliary valve member to open a fluid connection between the high pressure space and the needle control chamber during the increasing fuel pressure step, as set forth in claim 9.

The prior art, alone or in combination, did not show or teach a method of hastening closure of a nozzle valve in a fuel injector including the step of increasing closure force above the base closing force at least in part by relieving pressure on a closing hydraulic surface of an auxiliary valve member that fluidly separates the needle control chamber from a high pressure space in the fuel injector, as set forth in claim 16.

Art Unit: 3752

7. Claims 6-8 and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patents to Coldren et al., Cooke, and Guerrassi et al., and US Patent Application Publication to Bartkowiak et al., are cited as of interest.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Darren W. Gorman whose telephone number is 571-272-4901. The examiner can normally be reached on M-F 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Scherbel can be reached on 571-272-4919. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

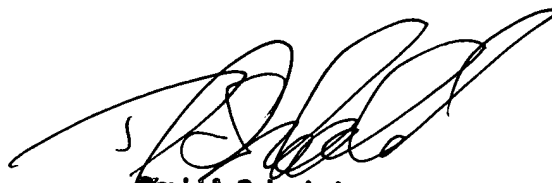
Art Unit: 3752

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Darren W Gorman
Examiner
Art Unit 3752

DWG 2/23/06

DWG
February 23, 2006


David A. Scherbel
Supervisory Patent Examiner
Group 3700